Delaunay triangulation as a new coverage measurement method in wireless sensor network

Abstract

Sensing and communication coverage are among the most important trade-offs in Wireless Sensor Network (WSN) design. A minimum bound of sensing coverage is vital in scheduling, target tracking and redeployment phases, as well as providing communication coverage. Some methods measure the coverage as a percentage value, but detailed information has been missing. Two scenarios with equal coverage percentage may not have the same Quality of Coverage (QoC). In this paper, we propose a new coverage measurement method using Delaunay Triangulation (DT). This can provide the value for all coverage measurement tools. Moreover, it categorizes sensors as 'fat', 'healthy' or 'thin' to show the dense, optimal and scattered areas. It can also yield the largest empty area of sensors in the field. Simulation results show that the proposed DT method can achieve accurate coverage information, and provides many tools to compare QoC between different scenarios.